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**Dye removal using polypyrrolic nanoencapsulates**

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New Delhi, April 03: Dye removal by a green method, is of considerable interest for the sustainable future. Polypyrroles being natural mimics have promising photophysical properties which in turn facilitates light harvesting. Due to lack of solubility in aqueous medium, their practical applications are restricted. Hence, development of biodegradable polymeric nanoencapsulates can be of considerable interest to leverage the photophysical properties of polypyrroles.

Herein, we report the synthesis of polypyrroles (BODIPYs and porphyrins) which were further encapsulated into PLGA polymer to impart hydrophilicity. The polypyrroles and their nanoencapsulates were further examined for photophysical properties (namely, fluorescence quantum yield, singlet oxygen quantum yield and lifetime measurements). Then the photocatalytic dye degradation potential of the synthesized entities in the presence of low-cost LED lights were evaluated and correlated with their photophysical characteristics. This photocatalytic phenomenon exhibited by the polypyrrolic nanoencapsulates can be further translated in agri-biomass degradation through photocatalytic intervention in the presence of polypyrroles and the work is in progress.

These research findings have accomplished by Dr. Jayeeta Bhaumik with team members Mr. Yeddula Nikhileshwar Reddy and Dr. Neeraj Singh Thakur. The research outcome has been published in ChemNanoMat (a Wiley journal) in 2020 (doi.org/10.1002/cnma.201900466) and an Indian patent has been filed (201811044076).

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